



DEPARTMENT OF THE NAVY

NAVAL SEA SYSTEMS COMMAND
1333 ISAAC HULL AVENUE, S.E.
WASHINGTON NAVY YARD, DC 20376-0001

IN REPLY REFER TO:
5200
Ser 03/06
24 March 04

From: Commander Naval Sea Systems Command

Subj: SCHEDULE FOR HUMAN SYSTEMS INTEGRATION (HSI) PROGRAM
REVIEWS

Ref: (a) NAVSEA NOTICE 5400 Ser 10/251 of 15 Oct 2002
(b) NAVSEAINST 5400.97A Ser 05BX/001 of 3 Feb 2003
(c) NAVSEA Acquisition Support Office memo Ser 1053/006
of 23 Feb 04

Encl: (1) HSI Program Review Schedule
(2) HSI Program Review Checklist
(3) HSI Program Review Process / Notional Schedule
(4) Pre-ARB HSI Program Review Process / Notional
Schedule
(5) ARB HSI Program Review Checklist
(6) ARB HSI Brief Template
(7) DoD 5000 Series (Encl 7) - HSI Procedures
(8) HSI Program Review Documentation Listing
(9) Example Outline for a Human Systems Integration
Plan (HSIP)

1. Per reference (a), NAVSEA 03 responsibilities include establishing corporate NAVSEA HSI policy and standards, developing HSI certification criteria, human performance metrics and evaluation techniques, and conducting periodic reviews of acquisition program HSI plans and products. By reference (b) COMNAVSEASYS COM established the Deputy Commander for Human Systems Integration (SEA 03) as the Command's technical authority for certifying that ships and systems delivered to the Fleet are enhancing sailor performance, optimize manpower, personnel and training, and promote personnel safety, survivability and quality of service. Enclosure (1) promulgates the NAVSEA 03 HSI Program Review Schedule.

2. Enclosure (2) provides a comprehensive NAVSEA 03 checklist that shall be used to prepare for and conduct HSI Program Reviews. Not all HSI elements are applicable nor of equivalent priority to every program. Accordingly, each NAVSEA 03 HSI Program Review will be coordinated and tailored in advance with the respective Program Office. Enclosure (3) provides a timeline of the NAVSEA 03 HSI Program Review process.

Subj: SCHEDULE FOR HUMAN SYSTEMS INTEGRATION (HSI)

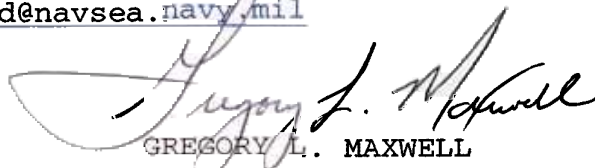
3. In addition to NAVSEA 03 Staff, Program Managers and their representatives, appropriate OPNAV Program Sponsors including representatives from Human Performance, Manpower, Personnel and Training community will be invited to attend these reviews. Specific date, time and location information for these reviews will be coordinated with the respective program office, and will be held in a conference setting.

4. As announced in reference (c), SEA 03 has been added as a member for all future NAVSEA and associated PEO Acquisition Review Boards (ARBs) and will be assessing HSI in designated programs. Our overall schedule has been developed in conjunction with the published SEA 1053 ARB schedule to avoid duplicative review processes. Accordingly, an abbreviated HSI review will be conducted as a precursor to all ARBs using a web-based review approach. In preparation for ARBs, NAVSEA 03 will coordinate with SEA 04 to ensure Performance Based Logistics (PBL) and HSI assessments do not duplicate efforts. Enclosure (4) provides the Notional Pre-ARB HSI Review process. Enclosure (5) provides an ARB HSI abbreviated checklist that shall be used to prepare for ARB Reviews. Enclosure (6) is the ARB HSI Status Brief Template that will be inserted into the SEA 1053 ARB presentation viewgraphs and briefed at the ARB.

5. Enclosure (7) provides the DoD 5000 Guidance on HSI program requirements. Enclosure (8) lists the documentation required to conduct a thorough program review. Enclosure (9) provides a sample format for an HSIP.

6. A tailored web site has been developed by NAVSEA 03 to facilitate the pre-review exchange of information and ongoing dialogue following the review. This web site will include program data related to lessons learned, program status and program risks. URL for this site will be published under separate cover.

7. NAVSEA 03 point of contact for HSI Program Review coordination and scheduling is Ms. Rhonda Barton, (202) 781-3276, email at bartonrd@navsea.navy.mil


GREGORY L. MAXWELL
By direction

Subj: SCHEDULE FOR HUMAN SYSTEMS INTEGRATION (HSI)

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HSI Program Review Schedule

Directorate/PEO/PM Code Program Title	ACAT	Next Milestone & Date	PM Name & Phone Number	PM HSI POC & Phone Number	NAVSEA 03 Program Review Team Leader & Phone Number	NAVSEA 03 HSI Review Date
<u>2004 Milestones</u>						
PEO IWS IWS 1A5 Total Ship Training System (TSTS)	IVM		Mr. R. Bragg (202) 781-4334	Trish Hamburger (540) 653-1119	JoAnn Murray (202) 781-2162	Apr 04
PEO SUBS, PMS 450 SSN 774 Virginia Class Submarine	ID		CAPT J. Heffron (202) 781-1294	Dave Restifo (202) 781-1241	Vernon Wong (202) 781-3758	May 04
PEO IWS, IWS 6A Cooperative Engagement Capability (CEC) AN/USG-2	ID		CAPT M. Frick (202) 781-1977	Trish Hamburger (540) 653-1119	Mildred McCullough (202) 781-0835	Jun 04
PEO IWS, IWS 3C Naval Fires Control System	III	MS III, Sep 04	Mr. J. Ripley (Acting)	Trish Hamburger (540) 653-1119	Don Burrows (202) 781-3539	Jul 04
PEO LMW, PMS 210 Airborne Laser Mine Detection System (ALMDS)	II	MS C, Oct 04	CAPT V Jimenez (202) 781-4376	Ken Haas (202) 781-1613	Kurt Yankaskas (202) 781-4349	Aug 04
PEO SHIPS, PMS 400S SMARTSHIP Integrated Ship Controls (ISC)	IVT		Mr. G. Sturtevent (202) 781-2245	Trish Hamburger (540) 653-1119	JoAnn Murray (202) 781-2162	Sep 04
PEO LMW, PMS 403 Long Term Mine Reconnaissance System (LMRS) AN/BLQ-11	II	MS III, Dec 04	CAPT P. Ims (202) 781-4413	Art Hommel	CDR Mark Werner (202) 781-2496	Oct 04
PEO IWS, IWS 6B AN/WSN-7B(V) Ring Laser Gyrocompass (RLG)	AAP		CAPT D. Ditko (202) 781-4198	Trish Hamburger (540) 653-1119	Dave Anderson (202) 781-3608	Nov 04
<u>2005 Milestones</u>						
PEO SHIPS, PMS 500 DD(X) Destroyer	ID	Mar 05	CAPT C. Goddard (202) 781-2532	CDR Arnwine (202) 781-2610 Joe Horvath (202) 781-2585	Rhonda Barton (202) 781-3276	Jan 05

Enclosure (1)

HSI Program Review Schedule

PEO IWS, IWS 2A AN/SPY 1 Radar Upgrade (AN/SPY-1D(V))	II	Apr 05	CAPT A Haggerty (202) 781-2055	Trish Hamburger (540) 653-1119	Don Burrows (202) 781-3539	Feb 05
PEO IWS, IWS3C MK 45 5"/62 MOD 4 (Gun Extended Range Modification)	III		Mr. J. Pipley (Acting)	Trish Hamburger (540) 653-1119	Vernon Wong	Mar 05
PEO SHIPS, PMS 501 Littoral Combat Ship (LCS)	PreMDAP		Mr. J. Heller (202) 781-2582	LT Rob Abbott (202) 781-2600	Kurt Yankaskas (202) 781-4349	Apr 05
PEO LMW, PMS 210 Airborne Mine Neutralization System (AMNS)	II	Jul 05	CAPT V Jimenez (202) 781-4376	Ken Haas (202) 781-1613	Eddie Curry (202) 781-3002	May 05

Enclosure (1)

HSI PROGRAM REVIEW CHECKLIST

This checklist is provided for guidance and annotated with reference information, and is representative of the information we look for while conducting the HSI program reviews. A tailored checklist will be used for each review which is specific to ACAT category, Milestone, and type of program.

1. Briefly describe the system mission objectives and functional description showing traceability from ORD to program documentation. Identify the predecessor system.
2. Identify next milestone as well as initial operating capability dates.
3. Identify those platforms on which the system will be installed.
4. Describe programmatic requirements:
 - Schedule with milestones
 - Level of effort estimates,
 - Facility and equipment requirements,
 - (4) Program funding requirements (actual budget vs. requirements; level of resources required to accomplish each HSI Domain (Human Factors Engineering, Manpower, Personnel, Training, Habitability, Personnel Survivability, Environment, Safety and Health (ESH); and Resource Sponsors).
5. Describe the status of the Human Systems Integration Plans (HSIP). Demonstrate the execution of a disciplined HSI process, in accordance with the HSIP, that includes human performance data collection and measurement. Describe how the HSI process is integrated with the systems engineering, total ship computing, ILS, Test & Evaluation, and risk management processes. (Reference: *Enclosures (5) and (6)*)
6. Demonstrate that sufficient and stable resources have been allocated to execute all aspects of the HSIP across the Future Years Defense Plan and through all acquisition and modernization phases.

7. Describe the Human Factors Engineering (HFE) objectives sought and/or achieved, and analyses conducted. Demonstrate that HFE is integrated with systems engineering (to include function and task allocation) to provide for effective human-machine interfaces, mitigate safety and health issues, and meet established HSI requirements. Link human performance metrics to the task analysis conducted as part of the Top Down Requirements Analysis (TDRA).

(Reference: NAVSEAINST 3900.8 Human Factors in the Naval Sea Systems Command; MIL-HDBK-46855A Human Engineering Requirements for Military Systems, Equipment, and Facilities; American Society for Testing & Materials (ASTM) 1166-95a - Standard Practice for Human Engineering Design for Marine Systems, Equipment and Facilities; ASTM F-1337 - Standard Practice for Human Engineering Program Requirements for Ships and Marine Systems, Equipment, and Facilities)

8. Provide the data, including the results of the TDRA, which supports manpower determinations (shipboard and shore infrastructure) from the allocated functions and tasks throughout the design process. Show that total ship integration is considered in the analysis and total force manpower requirements have been addressed. Address the workload intensive tasks, process improvements, design options or other initiatives used to reduce manpower and improve the efficiency or effectiveness of support services. (Reference: OPNAVINST 1000.16J Manual of Navy Total Force Manpower Policies and Procedures; OPNAVINST 1500.76 Navy Training System Requirement, Acquisition and Management; CNO P-751-1-9-97 Navy Training Requirements Determination Manual (NTRDM))

9. Demonstrate that the human performance requirements of the user population are based on the new or modernized system description, anticipated skills, projected characteristics of target occupational specialties, and recruitment and retention trends. Identify high driver skills and occupational specialties and demonstrate that potential issues have been addressed and minimized to the greatest extent possible. Provide trade-off analysis documentation. (Reference: OPNAVINST 1500.76 Navy Training System Requirement, Acquisition and Management; CNO P-751-1-9-97 Navy Training Requirements Determination Manual (NTRDM))

10. Demonstrate that required Knowledge, Skills & Abilities (KSAs) for a new or modernized system were determined by workload and task analyses for appropriate missions and mission conditions, based on the TDRA, with traceability to HFE and Human-Centered Design analyses. The Training Process Planning Methodology (TRPPM) / Navy Training System Plan (NTSP) must effectively describe the training concept and how it was developed. Show consideration of new training technologies, fleet training initiatives, and integration with the Total Ship Training System (TSTS) and/or future Total Ship Training Architectures (TSTAs). The training workload, including training administration, should be incorporated into all manpower considerations. Show that test and evaluation schedule includes training effectiveness. (Reference: OPNAVINST 1500.76 Navy Training System Requirement, Acquisition and Management, and CNO P-751-2-97 Training Planning Process Methodology (TRPPM) Guide; CNO P-751-3-9-97 Training Planning Process Methodology Manual; CNO P-751-1-9-97 Navy Training Requirements Determination Manual (NTRDM))

11. Address the detection of and protection against instantaneous, cumulative and residual nuclear, biological and chemical weapon effects, the integrity of the crew compartment against such effects, as well as, protection against fratricide. Show that the detection and protection against Chemical, Biological and Radiological (CBR) has been coordinated with the Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD). Describe the provisions for rapid egress when the system is severely damaged or destroyed. The PM shall also address special equipment or gear needed to sustain crew operations in the operational environment. As appropriate, antiterrorism/force protection measures shall also be addressed. (Reference: OPNAVINST 9070.1 Standard Specification for Ship Repair & Alteration Program; OPNAVINST 3401.3A Nuclear Survivability of Navy and Marine Corps Systems; OPNAVINST 3541.1E Surface Ship Survivability Training Requirements; MIL-HDBK 297 Introduction to Weapon Effects for Ships (Metrics))

12. Discuss Environmental, Safety and Occupational Health (ESOH) requirements to include: ESH risks, the strategy for integrating ESH considerations into the systems engineering process, identification of responsibilities, and the method of tracking progress. Demonstrate that applicable HSI

domains are actively involved with system hazard analyses, testing, and the processing of hazard action reports. Provide a summary of the Programmatic ESOH Evaluation (PESHE) document. (Reference: NAVSEA ESH Integration Guide for Program Managers; OPNAVINST 5100.27 Navy Laser Hazards Control Program, NAVSEAINST 8020.6D Navy Weapon System Safety Program, SECNAVINST 5100.10H Department of the Navy Policy for Safety, Mishap Prevention, Occupational Health & Fire Protection Program; OPNAVINST 5100.24 Navy System Safety Program; OPNAVINST 5100.23 Navy Occupational Safety & Health (NAVOSH) Program Manual; NAVSEAINST 5100.12A Requirements for Naval Sea Systems Command System Safety Program for Ships, Shipborne Systems & Equipment; MIL-STD 882 - DoD Standard Practice for System Safety)

13. Discuss the threshold requirements for living and working conditions, the physical environment and personnel facilities to optimize mission readiness, crew morale, professional development, retention, and recruitment that support system performance. (References: OPNAVINST 9640.1A Shipboard Habitability Program; Shipboard Habitability Design Criteria Manual, T9640-AB-DDT-010/HAB; Shipboard Habitability Practice Manual, T9640-AA-PRO-010/HAB; Habitability Materials List, Rev K, Ltr Ser 03M1/245 6 Nov 96 (available in hard copy only; MIL-STD 1623 Fire Performance Requirements and Approved Specifications for Interior Finish Materials and Furnishings); COMSC Instruction 9330.6D (Accommodation Standards for Military Sealift Command Ships))

14. Describe potential Measures of Effectiveness to be applied throughout the testing and training process to track Sailor learning and performance.

15. For SPMs - Discuss HSI contractual requirements for your program.

For PARMs - Discuss HSI performance requirements as they relate to Part I of your Ship Project Directives (SPDs).

(NOTE: Reference material is available on Inside NAVSEA City, under Tools and Apps, Specs and Standards (Information Handling System (IHS)). You can use IHS or ASSIST Quick Search (<http://assist.daps.dla.mil/quicksearch/>) links from that page.

References in paragraphs 7-10 can also be found on the Human Performance Center's Seamless Product Information, Data Exchange & Repository (HPC SPIDER) Website in their Reference Library link at: <http://www.ott.navy.mil>. OPNAV & SECNAV Instructions can be found at the Naval Electronic Directives System (NEDS) at: <http://neds.nebt.daps.mil/directives/dirindex.html>. References will also be available on the NAVSEA Training Acquisition (SEATRACQ) website at <https://seatraccq.navsea.navy.mil>).

HSI Program Review Process / Notional Schedule

Pre-review Phase

-2 Months

- o NAVSEA 03 HSI Program Review Coordinator schedules the review date, time and location with the Program Office HSI POC, schedules a plan-ahead meeting and selects the Program Review Team Leader, Domain leads and assists.
- o NAVSEA 03 HSI Program Review Coordinator and Team Leader conducts a plan ahead meeting with the Program Office HSI POC and his team, providing the following via the NAVSEA 03 website:
 1. Tailored review checklist
 2. Briefing Template
 3. Proposed agenda
 4. Self-assessment checklist
 5. Program Documentation List

-1 Month

- o Program Office provides the following for review via the NAVNAVSEA 03 website:
 1. Completed Self-assessment checklist
 2. Read-ahead package containing: Program Overview Brief, and acquisition documentation which could include TEMP, HSIP, SEMP, funding information, NTSP, PESHE)

-2 Weeks

- o NAVSEA 03 Review Team conducts preliminary assessment, identifies specific issues and submits inquiries to the Program Office

-1 Week

- o Program Office provides response to inquiries to NAVSEA 03
- o NAVSEA 03 conducts a pre-review team meeting
- o NAVSEA 03 Team Leader and PM HSI POC firm up agenda
- o NAVSEA 03 Domain Leads prepare findings and recommendation brief and provide to the NAVSEA 03 Team Leader

Review Phase

Program Review

- o Program Office provides abbreviated program overview briefing
- o NAVSEA 03 Program Review Team conducts findings and recommendations brief

Post-review Phase

+4 Weeks

- o NAVSEA 03 Program Review Team prepares draft "Findings and Recommendations" report
 - o NAVSEA 03 HSI Program Review Team Leader debriefs draft report to Program Office, and develops plan of action to address issues
 - o Final report signed by NAVSEA 03 and forwarded to PM, PEO, and NAVSEA 00
-

Follow-up Phase

Ongoing

- o Program Office addresses action items
- o NAVSEA 03 maintains / updates Lessons Learned Database with status of Program Office action items, available on NAVSEA 03 website

Pre-ARB HSI Program Review Process / Notional Schedule

Pre-review Phase

-2 Months

- o NAVSEA 03 HSI Program Review Coordinator verifies the ARB date, coordinates the HSI Review with the Program Office HSI POC, schedules a plan-ahead meeting and selects the ARB HSI Program Review Team Leader from NAVSEA 03
- o NAVSEA 03 HSI Program Review Coordinator and Team Leader conduct a plan-ahead meeting with the Program Office HSI Team to prepare for the HSI Status portion of the ARB review and provide the following via the NAVSEA 03 website:
 1. Tailored review checklist
 2. HSI Status Briefing Template for the ARB Brief
 3. Self-assessment checklist
 4. Program Documentation List

-1 Month

- o Program Office provides the following for review via the NAVSEA 03 website:
 1. Completed Self-assessment checklist
 2. Read-ahead package containing: Program Overview (power point), TEMP, HSIP, SEMP, funding information, TRPPM, NTSP PESHE...

Once the information is posted to the website, the NAVSEA 03 team reviews identifies specific issues and submits inquiries for additional information. The PM has 1 week to respond. Once responses are received the Review Phase starts. (Period of time between posting and review phase will depend on size of program and additional information needed).

Review Phase

ARB HSI Program Review Findings

- o NAVSEA 03 performs the ARB HSI review by reviewing the acquisition documentation and brief provided by the program office and completes their assessment at least 2 weeks before the scheduled ARB.

Post-review Phase

+1 Week

- o NAVSEA 03 Program Review Team prepares draft "Findings and Recommendations" report and HSI Status Viewgraph and provides to Program Office
- o NAVSEA 03 HSI Program Review Team Leader briefs NAVSEA 03 on the team's finding and recommendations in preparation for the scheduled ARB. (**Deliverable to NAVSEA 03 will include the report and the HSI Status Viewgraph**).

Scheduled ARB

- o NAVSEA 03 and/or the NAVSEA 03 HSI Program Review Team Leader attend the ARB and make recommendation to proceed or not to proceed to the next Milestone.
- o Within one week following the ARB, the NAVSEA 03 HSI Program Review Team Leader (ARB principal) will forward the HSI Findings/Assessment report to the ARB Chairman, copy to the Program Manager and Acquisition Support Office (SEA 1053).
- o Final ARB report is released by the ARB Chairman.

Follow-up Phase

Ongoing

- o Program Office addresses action items
- o NAVSEA 03 maintains / updates Lessons Learned Data base with status of Program Office action items, available on NAVSEA 03 website

ARB HSI Program Review Checklist

Management (Planning and Execution)

Has the program implemented and maintained a comprehensive plan for Human System Integration that includes a formal process to manage HSI activities, identifies HSI issues and risks and mitigation actions? (Human Systems Integration Plan (HSIP))

Program HSI Funding

Has sufficient and stable resources been made available to execute all aspects of the HSIP across the Future Years Defense Plan and through all acquisition and modernization phases?

Human Factors Engineering (HFE)

Is HFE integrated with systems engineering (to include function and task allocation) to provide for effective human-machine interfaces, meet established HSI requirements, as well as, mitigate safety and health issues IAW ASTM F1166 and MIL-STD 1472.

Manpower

Has a Top Down Requirements Analysis (TDRA) been conducted to support the manpower estimate, including Analysis of Alternatives (AoA), and has the program produced data to support manpower determinations from the allocated functions and tasks?

Personnel

Has the program defined the human performance characteristics of the user population based on the new or modernized system description, anticipated skills, projected characteristics of target occupational specialties and recruitment and retention trends?

Training

Does the Training Planning Process Methodology (TRPPM) / Navy Training System Plan (NTSP) effectively describe the training concept and how it was developed? Do these plans incorporate Knowledge, Skills & Abilities (KSAs) based on TDRA and workload for appropriate missions and mission conditions, consideration of new training technologies, fleet training initiatives, and integration with the Total Ship Training System (TSTS) and/or future Total Ship Training Architectures (TSTAs)?

Environment, Safety & Occupational Health (ESOH)

Does the acquisition strategy summarize the Programmatic Environmental, Safety and Occupational Health Evaluation (PESHE) document that addresses: ESOH risks, a strategy for integrating ESOH considerations into the systems engineering process, ESOH responsibilities, a method for tracking progress, and a compliance schedule for National Environmental Policy Act (NEPA)?

(NOTE: This checklist will be tailored to the program ACAT category, milestone and type of program being reviewed.)

HSI STATUS

HSI Domain	RQMTS	FUND	SCHED	REMARKS
HSI MGMT, PLNG, EXEC				
HUMAN FACTORS ENG.				
MANPOWER				
PERSONNEL				
TRAINING				
ESOH				

G – Essentially on plan Y – Potential significant deviation from plan R – Significant deviation from plan

Enclosure (6)

REASONS FOR STATUS DEVIATIONS

- For HSI domains with a status of “Y” or “R”, state the reason for the problem and when and how the problem is expected to be resolved.

E7. ENCLOSURE 7

HUMAN SYSTEMS INTEGRATION (HSI)

E7.1. General. The PM shall have a comprehensive plan for HSI in place early in the acquisition process to optimize total system performance, minimize total ownership costs, and ensure that the system is built to accommodate the characteristics of the user population that will operate, maintain, and support the system. HSI planning shall be summarized in the acquisition strategy and address the following:

E7.2. Human Factors Engineering. The PM shall take steps (e.g., contract deliverables and Government/contractor IPT teams) to ensure human factors engineering/cognitive engineering is employed during systems engineering over the life of the program to provide for effective human-machine interfaces and to meet HSI requirements. Where practicable and cost effective, system designs shall minimize or eliminate system characteristics that require excessive cognitive, physical, or sensory skills; entail extensive training or workload-intensive tasks; result in mission-critical errors; or produce safety or health hazards.

E7.3. Personnel. The PM shall work with the personnel community to define the human performance characteristics of the user population based on the system description, projected characteristics of target occupational specialties, and recruitment and retention trends. To the extent possible, systems shall not require special cognitive, physical, or sensory skills beyond that found in the specified user population. For those programs that require skill requirements that exceed the knowledge, skills, and abilities of current military occupational specialties or that require additional skill indicators or hard-to-fill military occupational specialties, the PM shall consult with personnel communities to identify readiness, personnel tempo (PERSTEMPO), and funding issues that impact program execution.

E7.4. Habitability. The PM shall work with habitability representatives to establish requirements for the physical environment (e.g., adequate space and temperature control) and, if appropriate, requirements for personnel services (e.g., medical and mess) and living conditions (e.g., berthing and personal hygiene) for conditions that have a direct impact on meeting or sustaining system performance or that have such an adverse impact on quality of life and morale that recruitment or retention is degraded.

E7.5. Manpower. In advance of contracting for operational support services, the PM shall work with the manpower community to determine the most efficient and cost-effective mix of DoD manpower and contract support. Once the Manpower Estimate is approved by the DoD Component manpower authority, it shall serve as the authoritative source for reporting manpower in other program documentation.

E7.6. Training. The PM shall work with the training community to develop options for individual, collective, and joint training for operators, maintainers and support personnel and, where appropriate, base training decisions on training effectiveness evaluations. The PM shall address major elements of the training system described in DoD Directive 1430.13, reference (bd), and place special emphasis on options that enhance user capabilities, maintain skill proficiencies, and reduce individual and collective training costs. The PM shall develop training system plans to maximize the use of new learning techniques, simulation technology, embedded

training, and instrumentation systems that provide anytime, anyplace training and reduce the demand on the training establishment. Where possible, the PM shall maximize the use of simulation-supported embedded training, and the training systems shall fully support and mirror the interoperability of the operational system. For training programs that require training infrastructure modifications, the PM shall identify technology, schedule, and funding issues that impact program execution.

E7.7. Environment, Safety and Occupational Health (ESOH). As part of risk reduction, the PM shall prevent ESOH hazards where possible, and shall manage ESOH hazards where they cannot be avoided. The acquisition strategy shall incorporate a summary of the Programmatic ESOH Evaluation (PESHE), including ESOH risks, a strategy for integrating ESOH considerations into the systems engineering process, identification of ESOH responsibilities, a method for tracking progress, and a compliance schedule for NEPA (42 U.S.C. 4321-4370d and Executive Order 12114, references (x) and (az)). During system design, the PM shall document hazardous materials used in the system and plan for the system's demilitarization and disposal. The CAE (or for joint programs, the CAE of the Lead Executive Component) or designee, is the approval authority for system-related NEPA and E.O. 12114 documentation. For acceptance of ESOH mishap risks identified by the program, the CAE is the acceptance authority for high risks, PEO-level for serious risks, and the PM for medium and low risks as defined in the industry standard for system safety.

E7.8. Survivability. For systems with missions that might require exposure to combat threats, the PM shall address personnel survivability issues including protection against fratricide, detection, and instantaneous, cumulative, and residual nuclear, biological, and chemical effects; the integrity of the crew compartment; and provisions for rapid egress when the system is severely damaged or destroyed. The PM shall address special equipment or gear needed to sustain crew operations in the operational environment.

HSI Program Review Documentation Listing

The following provides a list of documents that are requested in order for NAVSEA 03 personnel to become familiar with the program, program requirements and its implementation plan. This following list also includes a listing of analyses related to HSI domain areas. Note that the following is a generalized listing and some documents related may not be applicable to all programs and that some programs may utilize documents with other titles that contain similar information. The following should be use as a guideline for the "type" of information/documentation being requested by NAVSEA 03.

Overall HSI (Management) - Documents that provide an overall program description including summary of requirements, fielding plan, funding profile and related information.
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Relevant Documentation:

Program Plan including any documentation on areas, system, operations requiring modernization, including rationale.

Procurement Specification / SOW / Performance Specification

Acquisition Plan

Program Schedule of Deliverables and Milestones

System Engineering Management Plan (SEMP) / Program Management Plan

Fielding Plan / Implementation Plan with Major Milestones

Concept of Operations (CONOPs) / Operational Requirements Document (ORD) / Mission Needs Statement (MNS)
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List and description of ECPs/alterations involved and information on HSI analyses conducted on these changes.

Capability Production Document (CPD) / Capability Development Document (CDD)
--

Master Acquisition Program Plan (MAPP)
--

Risk Management Plan

Listing of Program Risks (along with ranking, selection methodology and actions being taken to address top program risks).
--

Integrated Logistics Support Plan (ILSP)
--

Maintenance Concept

Technical Documentation Concepts

Test & Evaluation Master Plan (TEMP) / Program Test Plans / OPEVAL Plan

Results of Usability Testing

Documentation on human performance, workload and safety problems to be resolved in the modernization.

Lessons learned from operations addressing human performance, workload, health and safety

HSI Program Review Documentation Listing

Results of mission analysis and generation of mission scenarios to support analysis, design and T&E.
Results of functional allocation describing roles of humans.
Results of technology assessments for human performance and safety implications
Documentation of Human Machine Interface design concepts.
List of available program documentation
Program Funding
Relevant Documentation:
Program Funding Profile including a breakout of funding related to HSI tasking.
POM Paper(s)
Overall HSI Planning and Execution
Relevant Documentation:
HSI Test and Evaluation Plan
HSI Inputs to TEMP
Existing T&E Reports concerning HSI Elements
Inputs to System Acquisition Documents
Human Systems Integration Plan (HSIP)
Human Factors Engineering Plan
HSI Inputs to Procurement Documents
Top Down Requirements Analysis (TDRA) / Top Down Functional Analysis (TDFA) / TDRA/TDFA Results
Human Factors Engineering Evaluation (HFE)
Relevant Documentation:
Comparison Systems Information
Mission Analysis
Function Analysis/Allocation
Task Analysis
Concepts, Designs, and Prototypes
Human Performance Analyses (Operations)
Human Performance Analyses (Maintenance)
Workload Analyses

HSI Program Review Documentation Listing

Situation Awareness Analyses
Style Guides & Industry Standards
Test & Evaluation Plans and Reports
Usability Testing
Workspace Configuration (operator)
Ergonomic Evaluation
Manpower
Relevant Documentation:
Manpower Assessment Report
Watch Quarter Station Bill
Manpower Estimation Report (MER)
Personnel and Crew Qualification Plan
Preliminary Ship Manning Document (PSMD) / Ship Manning Document (SMD)
Other Manpower Analyses
Personnel
Relevant Documentation:
Personnel & Crew Qualification Plan
Elements of Naval Training System Plan (NTSP)
Training
Relevant Documentation:
Training Analyses (Analyses to support TRPPM, Gap Analysis, Training Analyses, Operator Training Analysis, Maintainer Training Analysis, Training Requirements Analysis, etc.)
Training Development Plan (TDP) / Training Program Roadmap
Training Requirements Document / Training Front End Analysis
Naval Training System Plan (NTSP) / Navy Training Plan (NTP)
Training Effectiveness Evaluation Plan (TEEP)
Interoperability Training Plans / Analyses
Training Tradeoff Studies / Evaluation of Alternatives
Crew Scheduling and Phasing Plans (CSPP)
Training Analysis of Alternatives

HSI Program Review Documentation Listing

De-Crewing Plans
Personnel Survivability
Relevant Documentation:
Damage Control / Survivability Arrangements Document
Total Ship Vulnerability Analysis Report
Environment, Safety, and Occupational Health (ESOH)
Relevant Documentation:
Programmatic Environmental Safety and Health Evaluation (PESHE)
System Safety Program Plan / Safety and Hazard Analysis Report
Habitability and Quality of Life
Relevant Documentation:
Any Specialized Quality Of Life Surveys and Estimations
Quality of Life Assessment
Habitability Arrangements Document
Habitability Design Criteria Report

Example Outline for a Human Systems Integration Plan (HSIP)

- 1 Background/System Information
 - a. Program Summary
 - b. Acquisition Strategy
 - c. Program Schedule
 - d. Target Users (identify operators, maintainers and supporters of system)
 - e. Guidance
 - f. Constraints
2. Issues - Identify critical human system factors that have a significant impact on readiness, life cycle cost, schedule, or performance. It should include potential cost, schedule and design risks and trade-offs that concern human systems integration factors and plans to manage and reduce program risks. This analysis is based on high-driver, predecessor data:
 - a. Each HSI issue or opportunity
 - b. The impact of that issue or opportunity
 - c. What has been done
 - d. Potential solution(s) that have not been attempted
 - e. Proponent Agency

As issues are resolved, data on HSI costs (analyses, support) and benefit (cost savings and cost avoidance) should be captured.

3. Human System Integration Program
 - a) Tasks to be performed and skills required to execute those tasks
 - b) HSI milestones
 - c) Level of effort
 - d) Methods to be used
 - e) Design concepts to be used
 - f) Test & Evaluation program
 - g) Risk management
 - h) Identify potential cost, schedule, design, and performance risks that result from design aspects of HSI
 - i) Quantify such risks and their impacts on cost, schedule, and performance
 - j) Evaluate and define the sensitivity of such risks to HE design
 - k) Identify alternative solutions to moderate- and high-risk HSI problems and define their risks
Take actions to avoid, minimize, control, or accept each HSI risk

4. Human Factors Engineering - Describe how human factors engineering will be applied to the system design effort.
5. Manpower - Discuss manpower impacts of the new system as compared to its predecessor or comparable system(s) and state the sources of manpower resources for the new system. Discuss the process(es) used to generate manpower requirements for systems which have no predecessor or comparable equivalents.
6. Personnel - Discuss human performance requirements of the user population which should be based on the new or modernized system description, anticipated skills, and projected characteristics of target occupational specialties for highly qualified personnel or "hard-to-fill" military and civilian occupations, and how these personnel requirements will be met. Discuss how personnel requirements are/were coordinated with manpower requirements.
7. Training - Discuss how the required knowledge, skills and abilities (KSAs) for the system were determined by workload and task analyses for missions and mission conditions. Discuss how SkillObjects™ will be developed from the job task analysis, using the Sea Warrior common data structure. Summarize training design efforts and planning for implementation of training program. Map training design efforts to each major system/subsystem in the acquisition product (i.e., ship, system, hardware, software, etc.).
8. System Safety - Discuss efforts taken to identify and eliminate or minimize hazardous conditions in the acquisition product. Summarize how safety and health hazard lessons learned are being applied to the new system.
9. Sailor Survivability- Discuss efforts taken to identify and resolve personnel survivability issues concerning the acquisition product (i.e., efforts to mitigate nuclear, biological, radiological and blast effects on personnel and manned systems).
10. Habitability Requirements - Discuss efforts to identify and accommodate mixed gender users' capabilities, design space and service requirements to meet government and industry standards and incorporate growth considerations in the acquisition product.